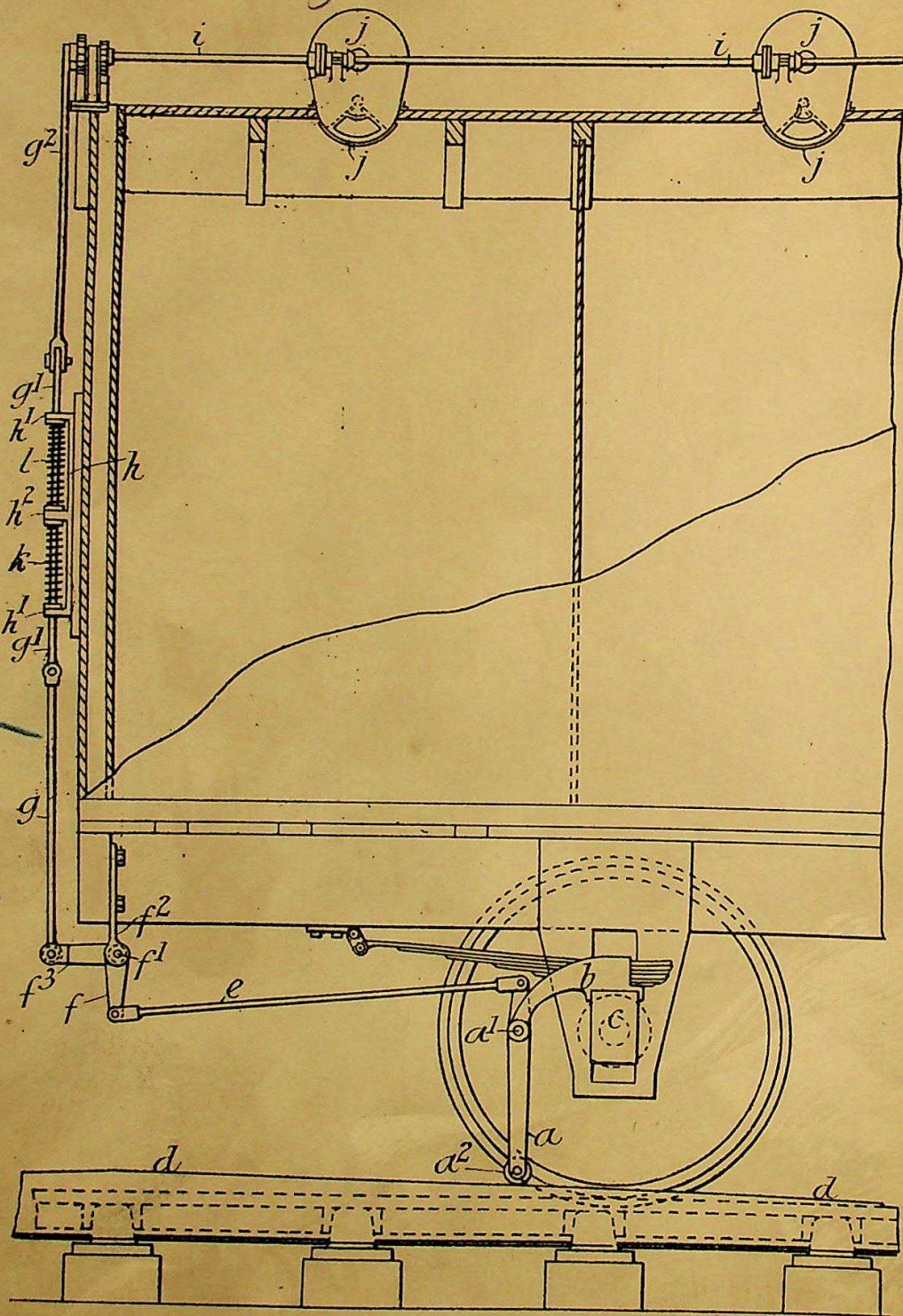


118. SIGNALS.  
Indicators--  
Station.

40-47  
40/370

SHEET 1.

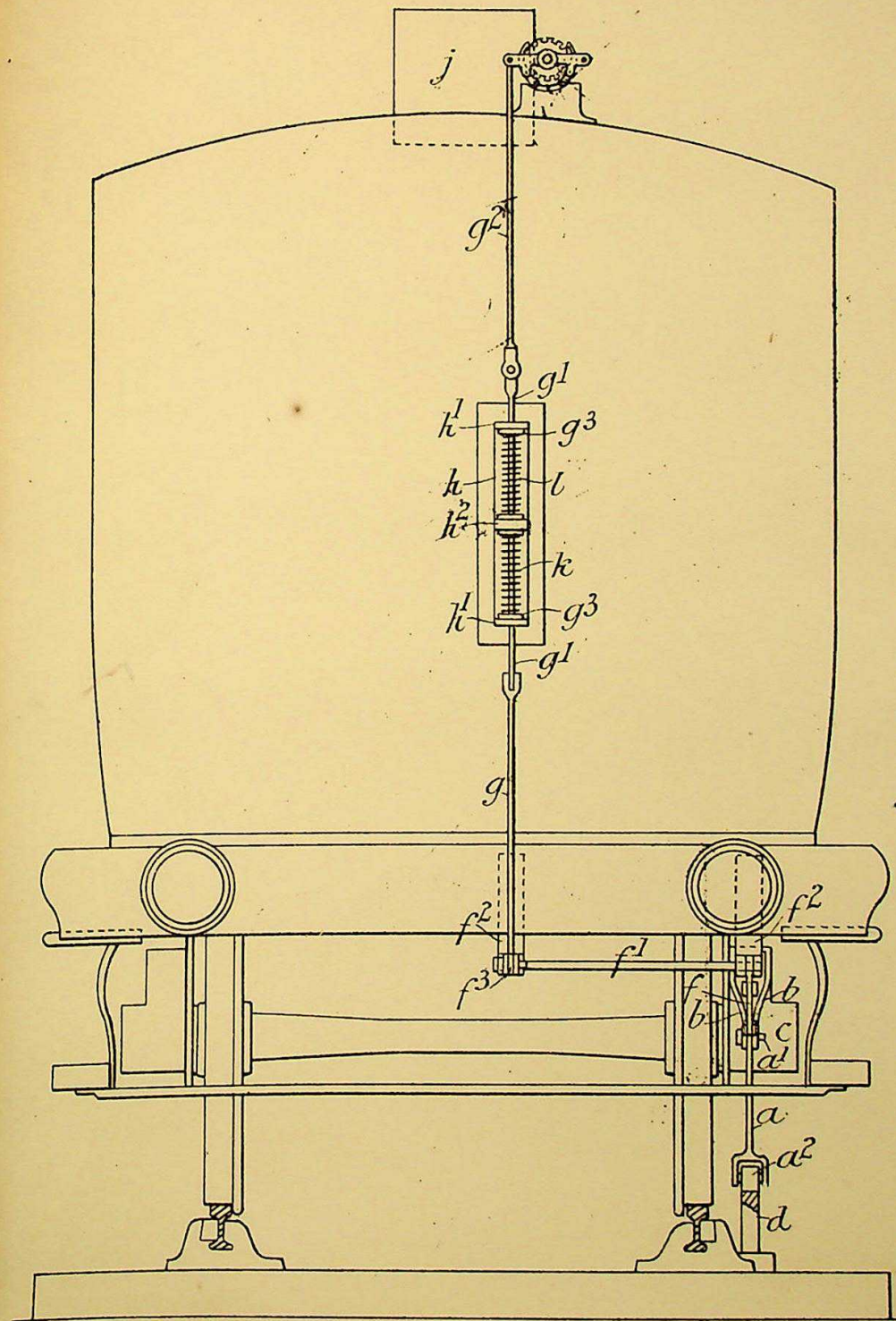
Fig. 1.



(6 SHEETS)

SHEET 2.

Fig. 2.



[This Drawing is a reproduction of the Original on a reduced scale]



116. SIGNALS.  
Indicators--  
Station.

SHEET 3.

Fig. 3.

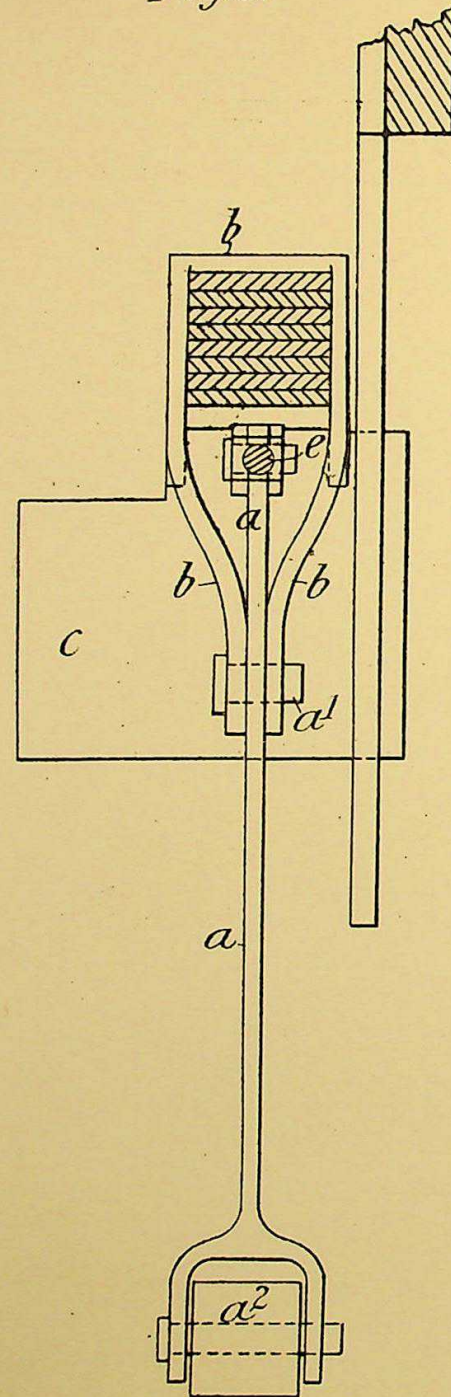


Fig. 5.

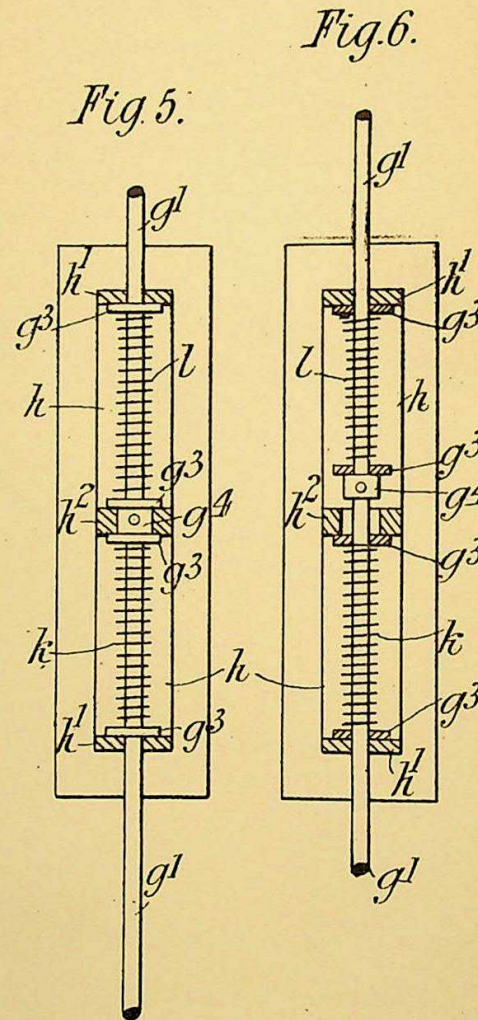


Fig. 6.

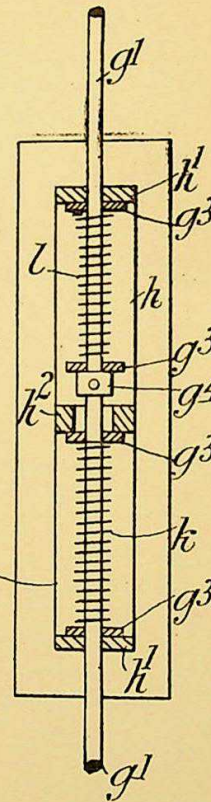
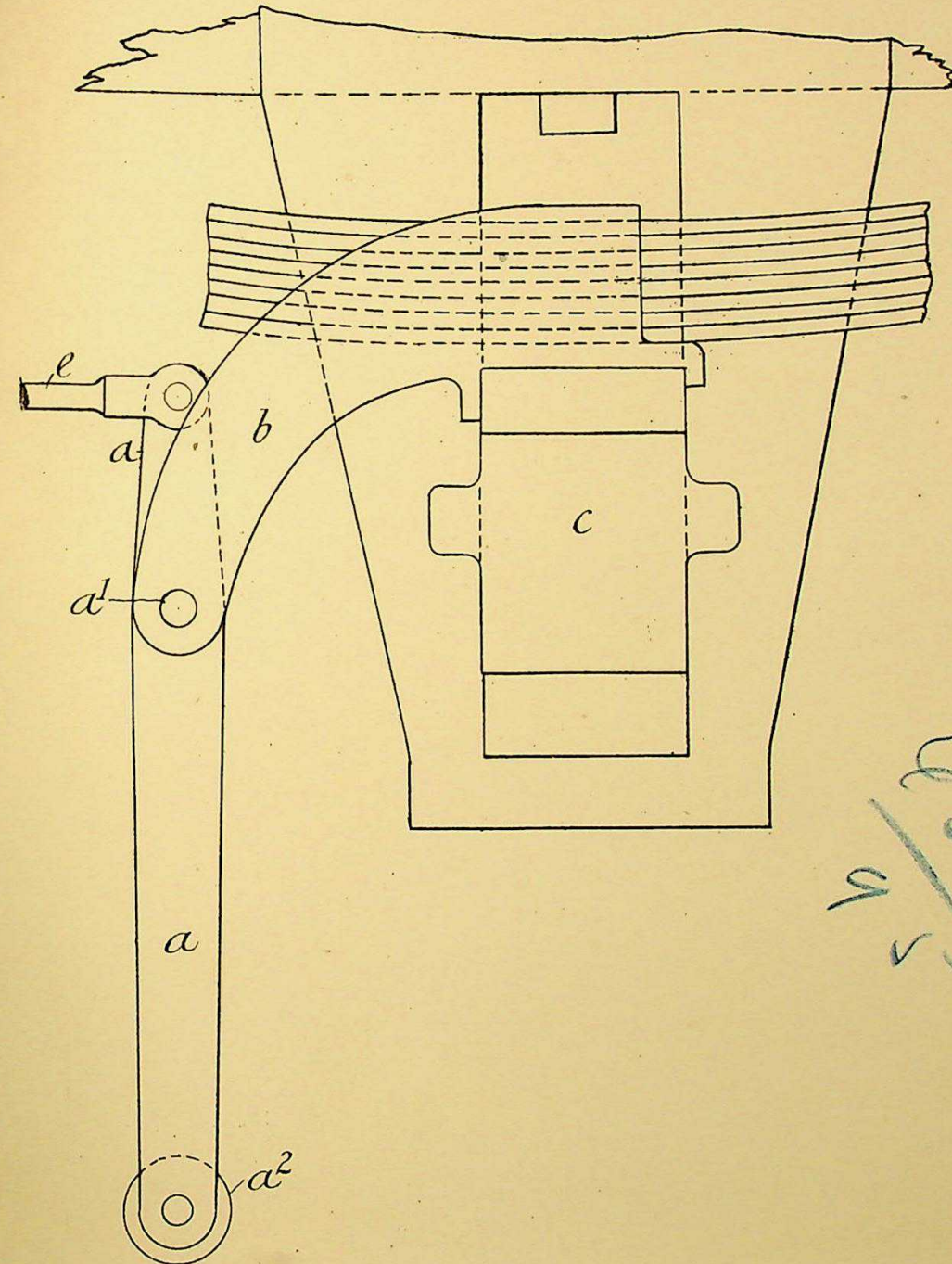


Fig. 4.



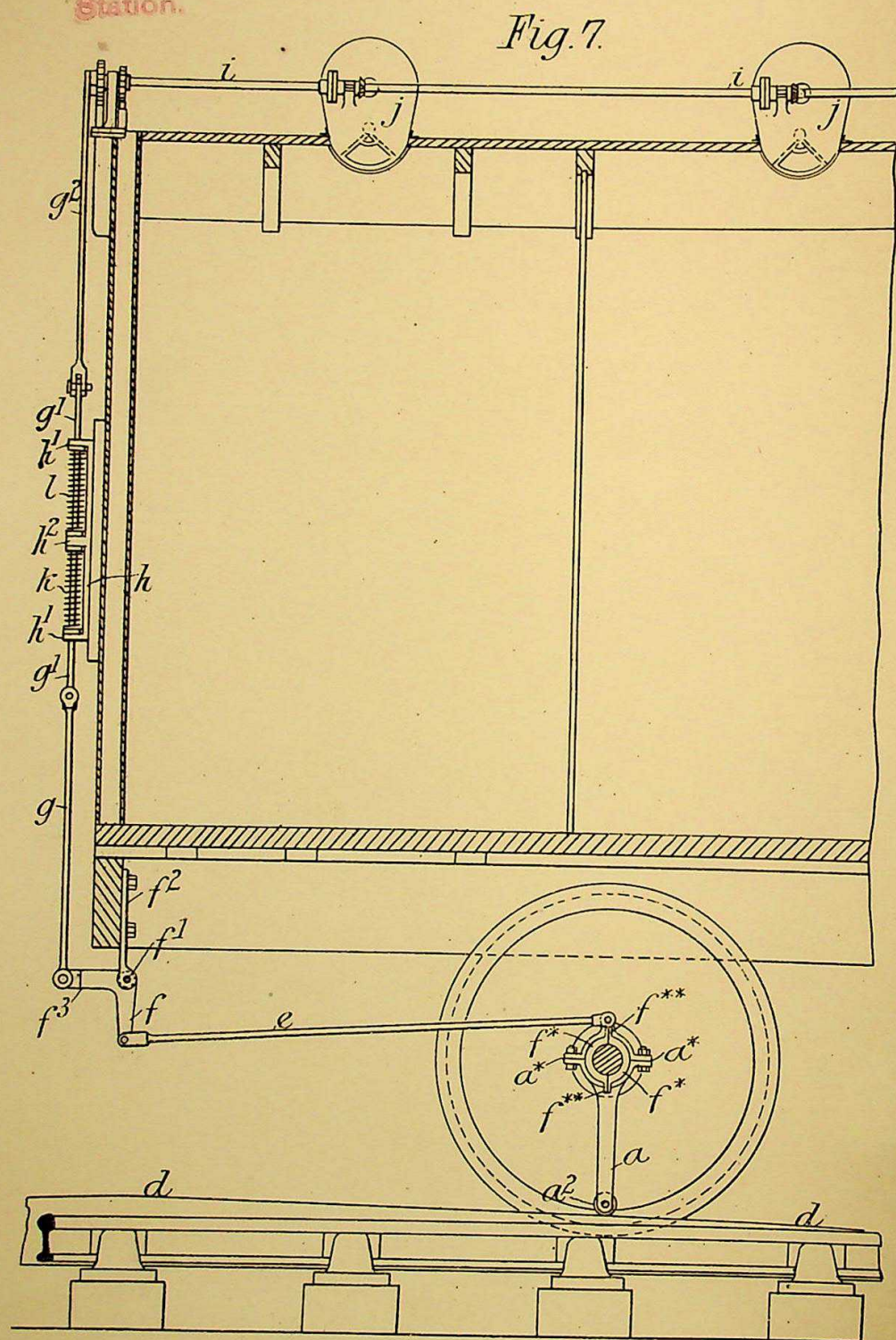
2361-5

[This Drawing is a reproduction of the Original on a reduced scale]



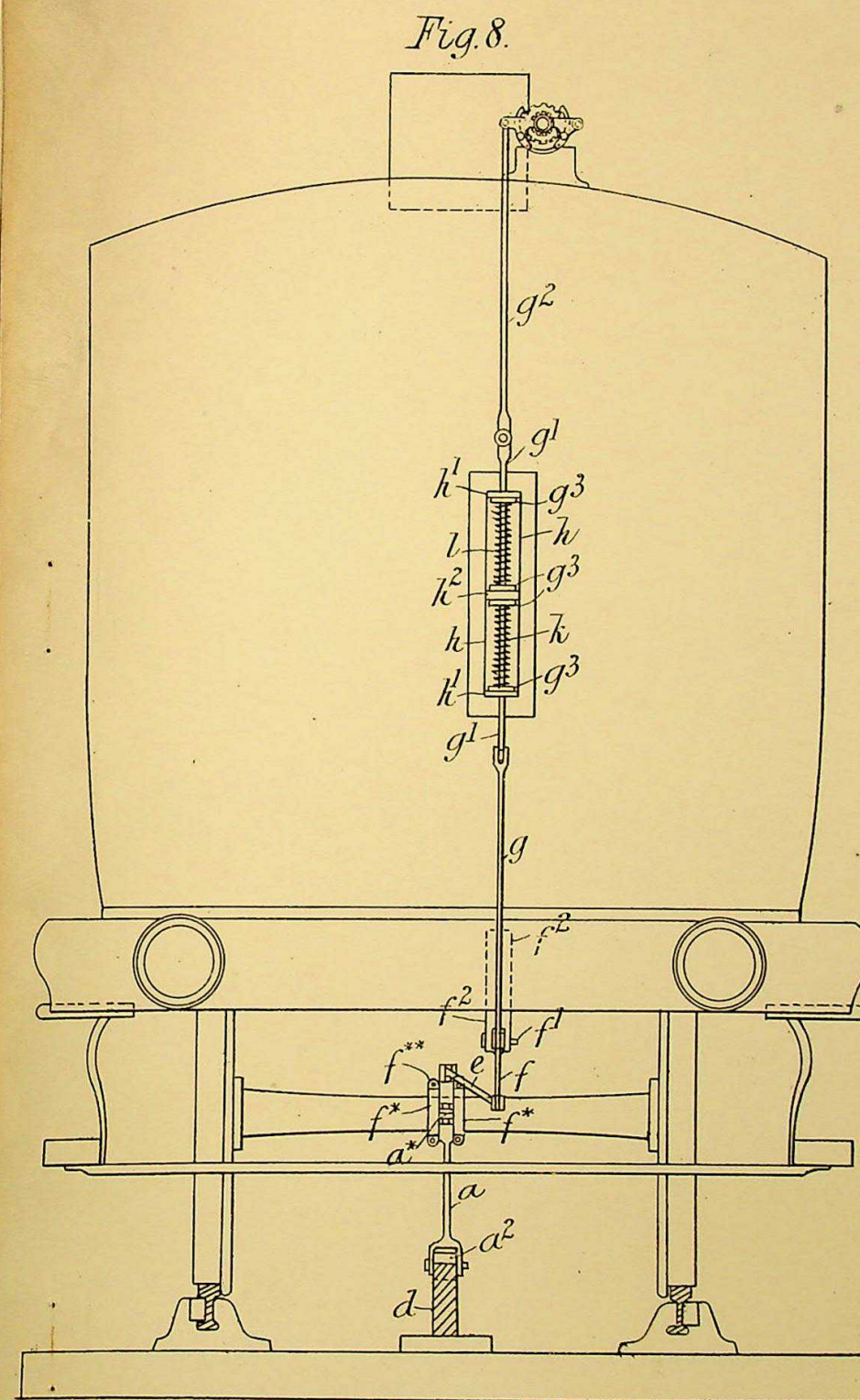
118. SIGNALS  
Indicators--  
Station.

SHEET 5.



( 6 SHEETS )

SHEET 6.



[This Drawing is a reproduction of the Original on a reduced scale.]

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DUPLICATE

N° 4361



A.D. 1895

*Date of Application, 28th Feb., 1895**Complete Specification Left, 28th Nov., 1895—Accepted, 28th Dec., 1895*

## PROVISIONAL SPECIFICATION.

## Improvements in Apparatus for Giving Motion to Station Indicators on Railway Carriages.

We, WILLIAM EGERTON HUBBARD, of 4 St. Helen's Place, in the City of London, Gentleman, CHARLES EDWARD VERNON, of Engineer's Office, Victoria Docks, in the County of Essex, Engineer, and GEORGE WASHINGTON ROBERTSON, of 4 St. Helen's Place aforesaid, Engineer, do hereby declare the nature of this invention to be as follows :—

The invention relates to an improved construction and arrangement of apparatus for giving motion to station indicators on railway carriages whereby we obtain simplicity of construction and action combined with a proper motion to the apparatus whether the carriage is loaded or not.

- 10 For this purpose we mount the first motion lever on an axis situated below the carriage body at some distance from the end thereof.

According to one plan we fix rigidly to one of the wheel axles, a sleeve made in two parts provided with flanges and bolted together; around this sleeve is a groove in which the first motion lever is mounted so as to move freely thereon; to facilitate the placing of the said lever in position, we form it in two parts, each having a half collar loosely fitting the groove in the sleeve and provided with flanges by which the two parts are bolted together.

Or said first motion lever may be mounted in bearings at the end of a bracket fixed to one of the axle boxes.

- 20 The lower limb of this first motion lever is furnished at its end with an anti-friction wheel in position to be acted upon by a double incline fixed in suitable position between the rails or at the side of one of them.

The upper limb of this lever, when mounted centrally or nearly so of the carriage body, is pinjointed to one end of a more or less nearly horizontal link, the other end of which is pinjointed to one arm of a bell crank lever mounted on an axis carried by a bracket fixed to the end of the carriage body; the other arm of this bell crank lever is pinjointed to the lower end of a vertical link, whose upper end is pinjointed to the lower end of a rod fitted, and capable of sliding, in guides fixed to the end of the carriage; the upper end of this rod is pinjointed to the lower end of a link, whose upper end, in any suitable manner, is connected with and gives motion to a horizontal shaft at the top of the carriage, which latter, by suitable gearing or connections, gives motion to the indicators within the carriage in any suitable manner.

- 30 When the first motion lever is mounted near the side of the carriage body, the upper limb thereof is connected by the link aforesaid with a lever fixed on one end of a shaft, which extends to or about the centre of the carriage end, where it has fixed thereon another lever, which is pinjointed to the vertical link hereinbefore referred to.

And in order that the first motion lever and apparatus may be kept normally in their central position and returned to such position immediately after having operated, we fit a spring or springs around the sliding rod at the end of the carriage, which, by acting against suitable abutments, act to keep and return the said sliding rod, and consequently the first motion lever, in and to their normally central position in readiness to be acted upon by the double incline in either direction of motion of the carriage.

[Price 8d.]



*Impts. in Apparatus for Giving Motion to Station Indicators on Railway Carriages.*

By mounting the first motion lever below the carriage body and at a distance from the end thereof, and connecting it by a more or less nearly horizontal link with a bell crank lever at end of carriage, the rise and fall of the carriage body in relation to the wheels has practically no injurious influence on the action of the apparatus.

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Dated this 28th day of February 1895.

HARRIS & MILLS,  
23 Southampton Buildings, London, W.C., Agents.

## COMPLETE SPECIFICATION.

Improvements in Apparatus for Giving Motion to Station Indicators 10  
on Railway Carriages.

We, WILLIAM EGERTON HUBBARD, of 4 St. Helen's Place, in the City of London, Gentleman, CHARLES EDWARD VERNON, of Engineer's Office, Victoria Docks, in the County of Essex, Engineer, and GEORGE WASHINGTON ROBERTSON, of 4 St. Helen's Place aforesaid, Engineer, do hereby declare the nature of 15  
this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The invention relates to an improved construction and arrangement of apparatus for giving motion to station indicators on railway carriages whereby we obtain simplicity of construction and action combined with a proper motion to the apparatus 20  
whether the carriage is loaded or not.

The invention is illustrated in the accompanying drawings, in which:—

Fig. 1 is a sectional side view of parts of a railway carriage fitted with our improved station indicator operating apparatus.

Fig. 2 is an end view of the same.

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Figs. 3, 4, 5 and 6 are detail views of parts drawn to larger scales than Figs. 1 and 2.

Fig. 7 is a sectional side view and Fig. 8 is an end view of a railway carriage showing a slight modification.

In carrying our invention into effect we mount the first or prime motion lever *a* 30  
on an axis *a*<sup>1</sup> situated below the carriage body at some distance from the end thereof.

According to the arrangement represented at Figs. 1 to 6, which we will first describe, we mount the axis of the first motion lever *a* in bearings at the end of a bracket *b* fixed to one of the axle boxes *c*. The lower limb of this first motion 35  
lever *a* is furnished at its end with an anti-friction wheel *a*<sup>2</sup> in position to be acted upon by a double incline or trailing cam *d* fixed in suitable position at the side of and parallel with one of the rails of each track. The upper limb of this lever is connected by a nearly horizontal link *e* with a lever *f* fixed on one end of a horizontal cross shaft *f*<sup>1</sup> mounted in brackets *f*<sup>2</sup> and which extends to or about the 40  
centre of the carriage, where it has fixed thereon another lever *f*<sup>3</sup>, the outer end of which is pinjointed to a vertical link *g*, whose upper end is pinjointed to the lower end of a rod *g*<sup>1</sup> fitted and capable of sliding in guides *h*<sup>1</sup> carried by a bracket *h* fixed to the end of the carriage; the upper end of this rod *g*<sup>1</sup> is pinjointed to the 45  
lower end of a link *g*<sup>2</sup>, whose upper end, in any suitable manner, is connected with and gives the required motion to a horizontal shaft *i* at the top of the carriage, which latter, by suitable gearing or connections, gives motion to the station indicators *j* in any suitable manner.

And in order that the first motion lever *a* and apparatus may be kept normally in their central position and returned to such position immediately after having 50  
operated, we adopt the following arrangement:—

Around the rod *g*<sup>1</sup> we mount two springs *k l* which act between two pairs of



*Impts. in Apparatus for Giving Motion to Station Indicators on Railway Carriages.*

collars or washers  $g^3$   $g^3$  mounted loosely on said rod. The rod  $g^1$  has fixed thereon a collar  $g^4$  located between the two central collars  $g^3$  and capable of passing freely through a hole in a central stop or lug  $h^2$  fixed to or forming part of the bracket  $h$ . Thus as the rod  $g^1$  is either raised or lowered by the action of the first motion lever  $a$ , the collar  $g^4$  on such rod will compress one or other of the springs  $k$   $l$  and, immediately after the first motion lever  $a$  has passed clear of the apex of the incline or cam  $d$ , said spring  $k$  or  $l$  will, by acting against the collar  $g^4$ , return the rod  $g^1$  and consequently the first motion lever  $a$  to their normal position in readiness to be again operated on the carriage passing over another incline or cam  $d$ . As will be seen at Fig. 6, during the time one of the springs, say  $l$ , is being compressed and tends to return the rod  $g^1$  to its normal position as already stated, the second spring  $k$  remains stationary between its two loose collars  $g^3$ .

As a modification the first or prime motion lever  $a$  may be mounted freely on one of the wheel axles, as represented at Figs. 7 and 8. In this case we fix rigidly to one of the wheel axles a sleeve  $f^*$  made in two parts provided with lugs or flanges  $f^{**}$  and bolted together; around this sleeve is a groove in which the first motion lever  $a$  is mounted so as to move freely thereon; to facilitate the placing of the lever  $a$  in position, we form it in two parts each having a half collar loosely fitting the groove in the sleeve  $f^*$  and provided with lugs or flanges  $a^*$  by which the two parts are bolted together. In this case the lever  $a$  is connected by the link  $e$  to the arm  $f$  of a bell crank lever, whose other arm  $f^3$  is connected to the vertical rod  $g$ ; in other respects the modification shown at Figs. 7 and 8 is similar to the arrangement shown at Figs. 1 to 6.

By mounting the first motion lever  $a$  below the carriage body and at a distance from the end thereof, and connecting it by a more or less nearly horizontal link with a bell crank lever arrangement at the end of the carriage, the rise and fall of the carriage body in relation to the wheels has practically no injurious influence on the action of the apparatus.

We would here remark that the construction of the indicators  $j$  represented in the drawings is of similar character to those shown in Letters Patent No. 11,170 of the year 1890 and No. 13,166 of the year 1893, and the means shown of communicating motion from the vertical rod  $g^2$  to the horizontal shaft  $i$  and from the latter to the indicators  $j$ , are of similar character to those shown and described in the latter of said Patents. These means and the construction of the station indicators may however be varied without departing from the nature of our present invention.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. The combination with station indicators on railway carriages, of a first motion lever mounted vertically on an axis carried by the axle of one pair of the wheels of the carriage in such a manner as to be moved always in a direction fore and aft of the carriage when acted upon by a double incline or trailing cam fixed in a suitable position on the track for the purpose of giving movement to the indicator operating mechanism, substantially as herein shown and set forth.

2. In means for operating station indicators on railway carriages, the combination with a first motion lever mounted on an axis carried by the axle of one pair of the carriage wheels and operated by a double incline or trailing cam, of mechanism for keeping the first motion lever and other parts normally in, or returning them after each action to, a central position, such mechanism consisting of a spring actuated rod fitted with two opposing springs, two sets of loose collars or washers, a fixed central collar mounted loosely in a bracket provided with a central and two end stops or lugs, the whole attached to the end of the carriage and forming an intermediate link in the device for conveying motion to the indicator operating mechanism, substantially as hereinbefore set forth.

3. In mechanism for keeping the first motion lever of station indicators on railway



*Impts. in Apparatus for Giving Motion to Station Indicators on Railway Carriages.*

carriages normally in, or returning it after each action to, a central position, the combination of a spring actuated rod fitted with two opposing springs, two sets of loose collars or washers and a fixed central collar, with a bracket mounted on the end of the carriage and provided with a central and two end stops, substantially as set forth. 5

4. The combination with mechanism for keeping the first motion lever of station indicators on railway carriages normally in, or returning it after each action to, a central position, of means for confining the action of the two opposing springs on the spring actuated rod to that of returning it to its central position and allowing said rod to compress only one of the two springs at a time, leaving the other spring stationary, substantially as and for the purpose hereinbefore set forth. 10

5. In means for operating station indicators on railway carriages, the combination of a double incline or trailing cam, a first motion lever mounted on an axis carried by the axle of one pair of the carriage wheels, a long substantially horizontal connecting rod connecting such first motion lever with the descending arm of a bell crank lever, said bell crank lever mounted in a bracket or brackets fixed to the carriage body, a vertical rod at one end of the carriage connected at its lower end with the normally horizontal arm of the bell crank lever, mechanism fixed to the end of the carriage for keeping the above mentioned parts normally in, and returning them after each action to, their central position, mechanism for connecting such vertical rod and centreing mechanism with and giving motion to a horizontal shaft on the top of the carriage, and gearing for communicating motion from such horizontal shaft to the station indicators, substantially as herein shown and described. 15 20 25

Dated this 28th day of November 1895.

HARRIS & MILLS,  
23 Southampton Buildings, London, W.C., Agents.

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